REMARKS

Entry of the foregoing and further and favorable reconsideration of the subject application in light of the following remarks, pursuant to and consistent with 37 C.F.R. § 1.112, are respectfully requested.

By the foregoing amendment, the specification has been amended to address the objection under 37 C.F.R. § 1.821(d). Specifically, the specification has been amended to include sequence identifiers for the sequences recited in Figure 6. Claims 1-16 have been amended to further clarify Applicants' invention. No new matter has been added.

I. Submission of Formal Drawings

Applicants submit herewith formal drawings. Please note that Figure 7 has been amended to recite the appropriate SEQ ID NO for "042." Support can be found in Figure 6. Figure 10 has been amended to recite the English term "trace" instead of the German term "Spur." Support can be found in the specification (see, for example, pages 29-30).

II. Rejections under 35 U.S.C. § 101

The rejection of claims 1-16 under 35 U.S.C. § 101 has been rendered moot in view of the amendments to the claims.

III. Rejections under 35 U.S.C. § 112

The rejection of claims 1-16 under 35 U.S.C. § 112, second paragraph, has been rendered moot in view of the amendments to the claims.

Claims 1-16 have been rejected under 35 U.S.C. § 112, first paragraph, as allegedly not being enabled.

The ultimate question is whether or not the specification contains a sufficiently explicit disclosure to enable one having ordinary skill in the art to practice the claimed invention without undue experimentation. See, e.g., *Ex Parte Forman*, 230 U.S.P.Q. 546, 547 (PTO Bd. App. & Int. 1986). That some experimentation is necessary does not preclude enablement unless the amount of experimentation is unduly extensive. See, e.g., *U.S. v. Telectronics, Inc.*, 8 U.S.P.Q. 2d 1217, 1222 (Fed. Cir. 1988).

The Examiner has stated, *inter alia*, that minor structural differences among structurally related compounds or compositions can result in substantially different biological activities and that it would require undue experimentation to arrive at the other EDb-fibronectin binding proteins encompassed by the claims.

Applicants submit that the specification provides guidance to enable one skilled in the art to practice the scope of the claimed invention. Applicants are not claiming just any protein that binds to the EDb-fibronectin domain and said binding is inhibited by a polypeptide that comprises SEQ ID NO:1, but applicants claim a protein that, *inter alia*, has the ability to bind specifically to an EDb-fibronectin domain, that is expressed or activated specifically in endothelial cells, that is expressed or activated specifically in a stromal cell of a tumor, that is expressed or activated specifically in a tumor, and that has a specific molecular weight. Thus, the skilled artisan is directed to a specific location where the protein is expressed (i.e., endothelial cells, stromal cells of a tumor, and tumor cells). Further, the protein has the function of binding to an EDb-fibronectin domain and has a specific molecular weight. Thus, there is not an infinite number of peptides to test (i.e., there is no undue experimentation). The Federal Circuit has held that "a patent may be enabling even though some experimentation is necessary; the amount of experimentation, however, must not be unduly extensive." *United States v. Telectronics, Inc.* 857 F.2d 778, 8 U.S.P.Q.2d 1217 (Fed. Cir. 1988). Further, routine experimentation does not constitute undue experimentation. *Johns Hopkins University v. Cellpro, Inc.* 152 F.3d 1342, 47 U.S.P.Q.2d 1705 (Fed. Cir. 1998).

The amount of experimentation, if any, is minimal or routine, and the specification clearly characterizes the claimed protein. Further, page 22 of the specification describes a binding assay whereby it can be determined whether a protein will bind to EDb-fibronectin domains. Furthermore, pages 25-28 describe additional assays where cells expressing a protein of the invention will bind (or not bind if an inhibitor is present) to a plate coated with EDb-fibronectin domains.

Thus, the specification provides sufficient guidance for one skilled in the art to practice the invention without undue experimentation, e.g., without having to screen an undue number of proteins.

Accordingly, applicants respectfully request withdrawal of this rejection.

Claims 1-16 have been rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter which was not described in the specification. Applicants respectfully traverse this rejection.

To comply with the written description requirement, it is not necessary that the specification describe the claimed invention in *ipsis verbis*. All that is required is that it reasonably convey to persons skilled in the art that, as of the filing date, the inventor had possession of the claimed subject matter. *In re Edwards*, 196 U.S.P.Q. 465 (C.C.P.A. 1978). Further, applicants are not required to provide an example for each protein that falls within the claim.

The Examiner has acknowledged that applicants are in possession of the $\alpha 2\beta 1$ protein that has the ability to bind specifically to the EDb-fibronectin domains. However, the Examiner alleges that applicants are not in possession of any protein whose binding to the EDb-fibronectin domains is inhibited by any polypeptide that comprises an amino acid sequence of SEQ ID NO:1. In addition, the Examiner has directed applicants to The Guidelines for Examination of Patent Applications Under 35 U.S.C. § 112, first paragraph.

The Guidelines state that "the written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species [there may be situations where one species adequately supports a genus] by actual reduction to practice, reduction to drawings or by disclosure of relevant, identifying characteristics, *i.e.*, structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics . . . ." Further, the PTO training materials for Written Description provide examples of claims that satisfy the written description requirements set forth in § 112. For example, a claim drawn to variants of a disclosed protein sequence does not violate the written description requirement if the claim recites that the variants are structurally similar to the disclosed sequence and possess the same function as the disclosed protein (see Example 14 for proteins and Example 9 for nucleic acids). Further, in Example 14, the procedure for determining if the variants possess the claimed function was described in the specification.

In the subject application, applicants claim proteins that have the same functional characteristics as the disclosed $\alpha 2\beta 1$ protein (i.e., the claimed protein binds specifically to an EDb-fibronectin domain, is expressed or activated specifically in endothelial cells, is

expressed or activated specifically in a stromal cell of a tumor, is expressed or activated specifically in a tumor cell, wherein binding of said protein to the EDb-fibronectin domain is inhibited by a polypeptide comprising SEQ ID NO:1, and has an apparent molecular weight of 120-130 kDa for the light chain and 150-160 kDa for the heavy chain, determined by SDS-polyacrylamide gel electrophoresis). Further, the specification describes several assays (binding and inhibition) to determine if the protein possesses the described characteristics/functions. Thus, applicants have satisfied the written description requirement, in accordance with the PTO's own Guidelines, by disclosing relevant identifying characteristics (i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics). Therefore, in view of the foregoing, one of skill in the art would conclude that applicants were in possession of the claimed invention.

Accordingly, applicants respectfully request withdrawal of this rejection.

IV. Rejections under 35 U.S.C. § 102

Claims 1-16 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 5,583,203, Takada et al. and Kern et al, as is evidenced by U.S. Patent No. 5,120,830. Applicants respectfully traverse this rejection.

The Examiner has acknowledged that the cited references are silent as to many of the claim elements. However, the Examiner has relied on an inherency argument to support the § 102(b) rejection. Applicants submit that the cited references do not form a basis for inherent anticipation. Inherency cannot be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. *In re Oelrich*, 212 USPQ 323 (CCPA 1981). For inherent anticipation, it must be established that upon reading the disclosure, the skilled worker would invariably have been led to the claimed invention or the claimed invention must be invariably accomplished by following the prior art. *Electro Medical Systems v Cooper Life Science*, 32 USPQ2d 1017 (Fed. Cir. 1994). For example, it must be established that the protein of the cited references, which was obtained from placenta or platelets, is the same as the claimed protein, which is specifically expressed or activated in, for example, endothelial cells. Further, there is no suggestion or teaching in

the cited references that the two proteins have the same functions or properties. The Examiner has not presented nor alleged such evidence in the Office Action.

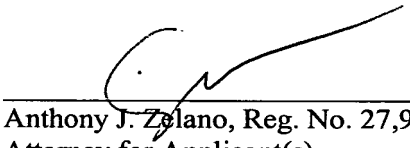
Therefore, applicants respectfully request withdrawal of the § 102(b) rejections.

In view of the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order. Such action is earnestly solicited.

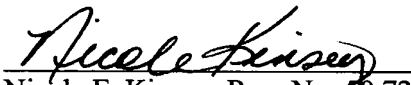
In the event that there are any questions relating to this application, it would be appreciated if the Examiner would telephone the undersigned attorney or agent concerning such questions so that prosecution of this application may be expedited.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



Anthony J. Zelano, Reg. No. 27,969
Attorney for Applicant(s)



Nicole E. Kinsey, Reg. No. 50,723
Agent for Applicant(s)

MILLEN, WHITE, ZELANO
& BRANIGAN, P.C.
Arlington Courthouse Plaza 1, Suite 1400
2200 Clarendon Boulevard
Arlington, Virginia 22201
Telephone: (703) 243-6333
Facsimile: (703) 243-6410

Date: May 14, 2003

NEK:jph

K:\Sch\1832\05-14-03 response.doc